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ABSTRACT

This paper presents findings of a study that utilized Elliott Jaques' theories of organizational depth structure and time span of discretion in administrative work to examine administrators' responsibilities in two Ontario (Canada) school systems. The theory predicts that the time-span of discretion associated with the administrative tasks will increase with the hierarchical rank of incumbents. Specifically, the study examined the effects of organizational size and enrollment (measures of school size) on administrators' time span discretion. The pilot study was conducted in two medium-sized school systems in Ontario. Interviews were conducted with a total of 38 participants--the principals and vice-principals at eight selected schools (two elementary and two secondary in each system), the district director (CEO), and all supervisory officers. Both superintendents and principals were found to be working at or close to the 2-year time-span level, with the directors of both systems engaging in work with a maximum time span of 3 years. Clearer hierarchical distinctions were evident in the work of vice-principals and department heads. These findings imply that the administrative responsibilities of principals are of equal weight and complexity to those of assistant superintendents, and thus the formal subordination of the former to the latter may be nonrequisite. Findings also indicate that school size, rather than school type, may be a more powerful determinant of the level of principals' administrative work. Overall, enrollment may serve as the best measure of a school's organizational size; however, the total number of employees is a more appropriate measure of organizational size for school systems. Five figures and four tables are included. (Contains 96 references.) (LMI)

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Time Span of Discretion and Administrative Work in School Systems: Results of a Pilot Study.

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Revised version of a paper presented at the Annual Meeting of the American Educational Research Association

New Orleans, 1994

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Abstract

Aspects of Elliott Jaques' theories of organizational depth structure and time span of discretion in administrative work were investigated in two Ontario (Canada) school systems. Jaques' theory predicts that the time span of discretion associated with the tasks accomplished in administrative roles will increase with the hierarchical rank of incumbents, the time span for the Chief executive being determined by the size of the organization, and the time spans of subordinate administrators being distributed across a predicted number of levels. If number of employees is taken as an appropriate measure of size for school systems, then the theory predicts that there would be three levels of operative or "deep" authority in the study systems, with a two year time span for the work of the CEO. If enrolment is used the appropriate measure of size, then the theory predicts the presence of four levels of operative authority with a time span of between two and five years for the chief executive. Estimates of time spans of discretion were obtained for the Directors (CEOs), superintendents, and selected principals, vice-principals, department heads and office managers in each system. Both superintendents and principals were found to be working at or close to the two-year time span level, with the Directors of both systems engaging in work with a maximum time span of three years. Clearer hierarchical distinctions were evident in the work of vice-principals and department heads. These findings imply that the administrative responsibilities of principals are of equal weight and complexity to those of (assistant) superintendents, and thus the formal subordination of the former to the later may be non-requisite. School level findings further imply that size of school may be a more powerful determinant of the level of administrative work done by principals than is type of school (elementary or secondary). Considered overall, the findings reported suggest that enrolment may serve as the best theoretically grounded measure of organizational size for schools, but that total number of employees is a more appropriate measure of organizational size for school systems. Results and conclusions are nonetheless severely constrained by data limitations associated with the pilot nature of the study.

Time Span of Discretion and Administrative Work

in School Systems: Results of a Pilot Study.

One of the issues of our times is public and political concern about school effectiveness and efficiency. Yet this is by no means a purely modern phenomenon. Historical accounts of schooling such as those given by Callahan (1962) and Tyack (1974) suggest that dissatisfaction with public schools, and especially their administration, is something of a constant. Among current and apparently continuing complaints are accusations that public schools are inefficient, poorly-managed, and less than fully accountable, the perennially advocated remedy for such ills being to organize and administer them in a more business-like manner. Yet the truth of such criticisms and the soundness of the proposed remedy are hard to assess. Relevant descriptive and evaluative data are often not readily available. But even if they were, against what comparative standards should they be assessed? Administrative structures and responsibilities vary considerably across the range of formal organizations evident in contemporary society, and organizational theory has yet to provide us with a comprehensive typology (Scott, 1981). Even so, a body of theory and research suggests that schools, and possibly school systems,[1] have organizational characteristics which make them quite different from business and commercial enterprises (Firestone & Herriott, 1982; Meyer & Rowan, 1977; Orton & Weick, 1990). This implies that ideal conceptions of organizational structure and efficiency developed in the business world may well provide a possibly dysfunctional basis for assessing or restructuring school system administration. It also points to the pressing need for research-informed understandings of school system administrative structures as a pre-requisite to any serious policy reforms aimed at enhancing their flexibility and responsiveness.

Elliott Jaques' theories of organizational depth structure offer a promising but strangely neglected framework within which to study these problems and draw theoretically meaningful comparisons with other organizations. In this paper we discuss results from a pilot study of key aspects of Jaques' theories undertaken in two Ontario school systems. Although primarily intended to refine

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[1] The term school system will be used throughout this paper to refer to sets of publicly-funded schools organized, usually geographically, into an administrative unit governed by a board of trustees and administered through and by a central bureau. This term is preferred to the more colloquial, and technically inaccurate and confusing, Ontario usage of "school board", and to "school district", which, although commonly used in the USA and at times in Western Canada, is somewhat strange to central Canadian ears.

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contact, entry, and data-collection methods, the study offers some intriguing insights into both the applicability of Jaques' theory to school systems and the organization of administrative work in such settings. Given the limitations of the study, our results must necessarily be viewed with caution. We hope the paper will nonetheless encourage more interest in Jaques' theories and their implications for school system organization, and help pave the way for further and more ambitious studies.

Conceptual Frame

To cite one of his (1976) relevant writings, Jaques' theory of depth structure is essentially a *General Theory of Bureaucracy*. His overall conception embodies a set of interrelated theories dealing with the structure and functioning of formal organizations and their management. Some of these theories, particularly those relating directly to job design, accountability, and equitable salaries, have found wide use in industrial, military and government settings, especially in the United Kingdom.

In brief, Jaques' theory predicts that regardless of the complexity of the formal hierarchy manifest in official organizational charts, all bureaucratic organizations of similar size will have the same number of operative authority levels. This depth structure—so-called because it underlies the formal or manifest structure typically shown in organizational charts—will be determined by the relative complexity of the administrative work and problems confronting the chief administrator: the larger the organization, the more complex and demanding the tasks facing the chief executive and the greater the need for subordinate levels of discretionary authority and responsibility. In Jaques' theory these authority strata are not distributed evenly, but occur at periodic threshold zones determined by discontinuities in the "time-span of discretion" associated with the work to be accomplished. As illustrated in Table 1, organizations with 340 or fewer employees are recognized as Stratum-III organizations, denoting a three level depth structure with a one year time-span profile for the work of the chief executive. Organizations with between 2,500 and 20,000 employees appear as Stratum-V systems with a 5 year time-span for leaders, and four levels of operative authority. The largest school systems in Canada and the United States accommodate more than 80,000 students, which implies that they could be Stratum VI organizations in Jaques' scheme, the industrial equivalent of which is a multi-national corporation. Is this the administrative reality faced by chief administrators of larger school systems? Previous work

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suggested that chief administrators of larger school systems are indeed faced with administrative tasks which are qualitatively different from those facing their colleagues in smaller systems (Allison, 1989). Jaques' theories of depth structure and time-span provide a parsimonious explanation for this and offer a potentially powerful framework within which to explore related aspects of organizational structure and administrative work in school systems.

While Jaques' theories, particularly some derivations relating to leadership (e.g. Jacobs & Jaques, 1987), are attracting growing attention in the broader literature, they have received little attention in the field of educational administration. McGee and Gibson (1985) reported a limited investigation of the equitable pay sub-theory in a single school district and Sashkin (1988) has incorporated a measure of time-span in his model of leader behaviour. As yet, however, there appear to have been no direct tests of the applicability of Jaques' theory to the organization of administrative work in school systems.

Direct tests of Jaques' theories in school settings should help us make progress with a number of theoretical and practical problems. Jaques' theories are explicitly designed to explain and predict the organization and efficient functioning of what he calls "AcH" systems. AcH is short for "Accountability Hierarchy" systems, the kind of organizations that are usually called bureaucracies in the technical literature. Not all organizations—or all parts of organizations—are of this type: academic departments in universities, partnerships, and parish churches, for example, do not fall within Jaques definition of an AcH, and thus his theory is not considered fully applicable to such organizations. Are schools/school systems AcHs? There are several independent theories that claim schools differ from business and other AcH organizations in potentially significant ways (Allison, 1983; Cohen, March & Olsen, 1972; Meyer & Rowan, 1978; Weick, 1976). This issue is of more than abstract interest given the increased demands for accountability that characterize our times, for if schools and/or school systems are not AcHs, then accountability measures based on the assumption that they are will not work, and may even do harm.

A related aspect of this broader problem is the question of whether schools or school systems constitute the most appropriate unit of organizational analysis and policy action. Theoretically school systems are assumed to exist and operate as an integrated—if in some respects loosely coupled—whole, with the central administrative offices being in a position to direct and co-ordinate the schools under their

authority. Yet as discussed by Hum (1985), Meyer and Rowan (1978) and others, individual schools can be notoriously resistant to external influences, even those which are "internal" to the system of which they are a part. Moreover, school principals are often assumed to enjoy—and frequently enjoined to exercise—substantial discretion with regard to how their schools will operate, this being the basal assumption in contemporary theories of transformational leadership. But to what degree and in what ways are schools and their principals formally subordinate and accountable to central offices? How do they fit into the operative—as opposed to the manifest—chain of authority and accountability? Jaques' theories and his associated methods for mapping the depth structure of organizations are particularly well suited for probing such questions.

There is also the related theoretical problem of the uncertain organizational status of students: should they be viewed as having membership status similar to that of employees in other formal organizations, or as clients, or as being equivalent to the "raw-material" material processed by the organization? As noted elsewhere (Allison, 1983), this is an important issue in attempting to apply theories of organizational structure and technology to schools. Given the widespread use of enrolment as a measure of school and school system size, it also poses a "calibration" problem in attempting to apply Jaques' theories, as his measure of organizational size, and thus depth structure, is the number of employees. We may, of course, find that this holds for school systems, bearing with it an implication that pupils must probably be conceptualized as clients or some form of "raw material". Yet pupils are indubitably present in the life and work of the schools, a point which cannot be lightly dismissed.

Finally, if the time-span construct is to be used meaningfully in leadership research and development (c.f. Sashkin's work), then direct tests of the broader theory are necessary to both validate the underlying theoretical claims and identify appropriate time-spans for administrative roles in schools and school systems.

The Theory

Time span is defined by Jaques (1964, 1989) as the longest maximum completion time for tasks undertaken in a role. This may be rendered in more direct terms as a "what-by-when": the accomplishment of a specific task within a given maximum time period, the length of the longest time period associated with a sanctioned task defining the time span associated with a role (1989, p. 16). This

will not necessarily be the same as the total amount of time taken to complete a task, for the role in question may require incumbents to be working on a variety of tasks at any time, the time span for the role being determined by the maximum completion time for the task which extends over the longest time period. Jaques argues that this provides an objective and comparable measure of "how big a job a person has, how heavy the responsibility is in a job" (1989, p. 16). Job specific tasks which require longer target completion times will be those which involve incumbents in larger, more complex and open-ended problems, the resolution of which will require the exercise of greater discretion, and thus carry greater responsibility.

Within AcHs as defined by Jaques, people are employed to do work, which he defines as the completion of tasks and assignments through the exercise of discretion and judgement. Specific kinds of work are assigned to and associated with defined roles organized into a formal hierarchy. Role incumbents report to and are held accountable by hierarchically superordinate managers, who are in turn accountable to *their* managers, designated as Managers once Removed (MoR) from the bottom role in this triad. In Jaques' theory managers supervise and co-ordinate the work done by their subordinates and are held accountable for the quality of their subordinates' work by their manager (the MoR). In assigning and monitoring subordinates work managers are expected to specify or otherwise establish, either explicitly or tacitly, maximum target completion times—time spans—for the tasks to be accomplished. Managers are also expected to be able to appraise the quality of work done by subordinates. On this basis Jaques has proposed an alternate definition of time span as "the longest period which can elapse in a role before a manager can be sure his subordinate has not been exercising marginally sub-standard discretion" (1978, p. 109). The construct of marginally sub-standard discretion does not necessarily equate to incompetence, which may become quickly apparent after an employee assumes a role. An employee may well be able to "muddle along" in a job without being able to fully master its requirements; without being fully "up to" the demands of the work. This is what is meant by marginally sub-standard discretion, the point of this alternative definition of time span being that managers must necessarily rely on the discretion of their subordinates within the time span of the work for which they are responsible.

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INSERT TABLE 1 ABOUT HERE

At the core of Jaques' theory is the claim that there are regular breaks in the time spans of work associated with hierarchically superordinate roles. As summarized in Table 1, these breaks are claimed to occur at 3 month, 1 year, 2 year, 5 year, and 10 year time span intervals. The nature of the work done--the complexity of problems encountered—within higher time spans is held to be qualitatively different, requiring higher levels of cognitive abstraction for successful completion. While the theory maintains that this depth structure underlies all AcHs, roles with the longer time spans and their associated higher levels of abstraction will only occur in sufficiently large organizations. As summarized in Table 1, Stratum IV organizations are considered to have a *maximum* of 2,500 employees and three "deep" layers of discretionary authority. The work of the chief executive will involve tasks extending over a two year time span and require him or her to operate at what Jaques terms the conceptual modelling level of abstraction in order to competently handle the problems encountered. Regardless of how many formal levels of authority may be shown on the organizational charts of Stratum IV organizations, the theory holds that the "true" managers will be located at the 1 year and the 3 month time span levels in the hierarchy (Jaques regards the Stratum I level as "non-managerial", and thus not a true authority stratum). Larger organizations are considered to require chief executives capable of operating at higher levels of abstraction over the longer time spans as shown in Table 1, with the operative levels of the hierarchy of authority being located at the stratum breaks as shown in the Table.

According to Jaques, one of the more common organizational pathologies involves situations where official job designations and reporting relationships assign authority to positions which are not requisitely aligned with the depth structure. In such situations the formally designated manager will typically be working at the same time span level as his or her formal subordinates. Both manager and subordinate may be thus engaged in qualitatively similar work. Jaques maintains that individuals in such non-requisite subordinate positions will often be intuitively aware of this and will consequently not regard their titular superordinate as their "real boss". When asked to identify their "boss"—that is the person to whom they are ultimately accountable for the completion and quality of the work they do—Jaques

predicts that persons in such non-requisite supervisory relationships will typically name the incumbent of the position at the next highest time span level in the depth structure underlying the manifest hierarchy.

One final point of interest concerns the final column in Table 1. Jaques argues that each of the major time span strata has an associated "felt fair pay" level. Employees expect to be paid a fair salary or wage for the work they do for their organizations. For Jaques this means that remuneration should match the level of the work done according to the time span of the job. He makes provisions for pay grades and other differentials within pay brackets, but wants to insist that equitable pay differentials for the key time spans will be as shown in Table 1. Actual monetary values will obviously vary with economic circumstances, but if an equitable salary for the two year time span level was determined to be, say, $95,000, then the equitable pay for jobs at the one year level would be 55% of this base ($52,250), while equitable pay at the five year level would be twice the base, namely $190,000 (Jaques, 1989, p. 110).

Design

The key data required in investigating the applicability of Jaques' theory to school systems are measures of the time span of discretion associated with different administrative positions in the formal hierarchy. Jaques' technique for measuring time spans within roles is deceptively simple:

> See the *manager* accountable for the role. Discuss with him or her examples of specific tasks in the role. Explore to find those tasks with the longest target completion time. In doing so, consider routinely occurring tasks, any development projects, and, if the role is a managerial one, tasks concerned with the induction and training of subordinates. If possible, review the same questions with the subordinate to ensure that no tasks are being overlooked. (1989, p. 135)

He adds that once a time span has been obtained for any role, it should be checked with the manager-once-removed to ensure that it falls within the limits of discretion he or she deems appropriate for the subordinate role in question.

Although apparently simple, the application of this procedure is complicated by two concerns. First, there is what Jaques (1989) terms "the main difficulty in measuring time span", this being "the almost total failure, which occurs world-wide, to have any understanding of the identification of a specific task in terms of a *what-by-when*". Consequently, "asking a manager about specific tasks or assignments which he/she assigns to a subordinate comes as an unfamiliar and awkward experience for most

people—and the managers who are asked to reply find it equally strange and awkward" (p. 135). Second, Jaques' theory implies that formal or manifest organizational charts will often not conform to his requisite depth structure, and thus a researcher will experience initial difficulties in identifying the appropriate managers and MoRs to question about the time spans of subordinate roles.

These and other concerns encouraged us to undertake the pilot study reported here before embarking on a larger inquiry. We began by drafting a standard interview protocol which included questions and probes designed to elicit time span estimates for the work done by the interviewee and his or her formal subordinates. Respondents were asked to describe their work and responsibilities and to identify specific tasks which they were required to complete. They were then asked to identify those tasks which take the longest time to complete and to specify the associated time span. Subsequent questions asked respondents to identify those formally subordinate to them in the organization (if any) and to describe the tasks and associated time spans undertaken by those subordinates. Respondents who identified subordinates were also asked how long it would take them to conclude, on the evidence, that new appointees to subordinate positions were going to experience continuing difficulties in coping with the demands of the job—the marginally sub-standard discretion definition of time span. All of the questions relating to time span were designed to allow for recursive questioning and reflection, and provisions were made to assist respondents in estimating time spans through successive approximation. In accord with Jaques' directions as given above, respondents were specifically asked about any development projects for which they had either been assigned or had assumed responsibility. Respondents were specifically asked to discuss and estimate their responsibilities for the induction and training of new subordinates with specific reference to associated time spans. All respondents were also asked to identify their "boss"—the person to whom they saw themselves as being accountable for their work. All were also asked to disclose their current salary and to declare whether they thought this represented fair compensation for the work they did.

Two limitations to the data generated by this questionnaire need mention. First, we did not implement Jaques' final step of checking time spans with the Manager once Removed from the job in question. Because we set out to interview incumbents in all adjacent positions down the formally defined hierarchies of authority in the study systems we were not sure that we could correctly identify appropriate

MoRs prior to analyzing the data collected. In retrospect this may have been an error, as we could have included a series of questions asking managers about the time spans of jobs supervised by their subordinates. This would, however, have extended what were already long interviews and considerably complicated analysis. The second limitation concerns the reliability of our data. Because the study was undertaken to pilot the interview protocol we were more concerned with testing and refining the questions and clarification techniques than in ensuring consistency across interviews. The two authors held frequent discussions about the quality of responses and the sequence and wording of the questions as the study progressed. As a result of these discussions the initial protocol was modified six times during the course of the study. These modifications primarily involved changes in the sequence and wording of questions, the main intent of the questions remaining unaltered. Even so, such changes must be seen as a significant threat to the reliability of our current data.

The study was conducted in two similarly sized Ontario school systems. These systems were selected to be representative of medium sized systems in the province. Both have enrolments which place them above the provincial median of c. 9,800, but well below the very large urban systems where enrolments exceed 80,000. Both serve mixed small town and rural populations dispersed across large geographical areas. As shown in Table 2, at the time of the study both had an identical complement of senior administrators, namely: a Director, who is the officially designated chief executive and educational officer of the board; four Supervisory Officers (superintendents), one of whom was the chief business official; and 29 school principals. In system A five principals were assigned to secondary (grade 9-12) schools and 25 to elementary schools (K-8), while system B had six secondary and 24 elementary schools. Neither system contained junior high schools.

INSERT TABLE 2 ABOUT HERE

Table 2 reports three measures of organizational size for each system, namely enrolment, total employees and total members. Enrolment is self explanatory, although it should be noted that the figures have been rounded to avoid inadvertently identifying the systems concerned. Total employees represents the sum of all teachers, administrators, office managers, clerical, janitorial and other staff

employed by the boards concerned. Total membership is simply the sum of enrolment and total employees. As shown by the size ranges in Table 1, Jaques' theory would designate both systems as Stratum V organizations if *either* enrolment *or* total membership were taken as constituting appropriate measures of organizational size (i.e. both measures fall between 2,500 and 20,000). If total employees is used as the measure of size, then both systems would be classified as Stratum IV organizations (i.e. between 340 and 2,500 employees).

Lists of schools and employees were used in conjunction with organizational charts to identify candidates for interview. Interviewees were selected so as to provide symmetrical samples from the two boards. Interviews were requested with the Director and all other supervisory officers [SOs] in each system, as well as with selected business managers and several consultants based in the central office. Two elementary and two secondary schools were studied in each system. These schools were selected so as to ensure that we studied one relatively large and one relatively small school of both types in each system. Table 3 provides descriptive data for the selected schools. As can be seen, the two large elementary schools both had higher enrolments than the smaller secondary schools in the same systems. Interviews were requested with the principals and, where present, vice-principals of each of the eight selected schools. Interviews were also sought with two department heads in each of the four secondary schools.

INSERT TABLE 3 ABOUT HERE

Interviews were eventually conducted with a total of 38 volunteers in the two systems, distributed as shown in Table 4. All interviews were conducted in offices or rooms in the subjects' place of work. Most interviews lasted approximately one hour, although some, primarily those with senior administrators, lasted almost two hours.

Rather than audio-taping the interviews, subject responses were directly transcribed onto computer disk using a laptop computer operated by the second author, the first author conducting all of the interviews. We found this method to be very satisfactory. In addition to circumventing the problems inherent in transcribing audio tapes, having both researchers present at each interview allowed us to

discuss and reflect on what transpired. These discussions greatly assisted our reviews and revisions of the interview schedule and also enhanced our interpretation of the data collected.

Results

Jaques' comments regarding the awkwardness generated by asking people about the work for which they are held accountable and for which they hold others accountable rang true throughout our interviews. Some interviewees were very uneasy about the principles of super and subordination underlying our questions. One vice-principal in particular rejected the very idea that he had a "boss" —an individual to whom he[2] was accountable for his work—stoutly maintaining that he and the other administrators in his system were all colleagues together. Interestingly, while there was high agreement among administrators that the management culture of this system (System B) placed a strong emphasis on collegiality, this vice-principal's principal had little difficulty in articulating the tasks for which he held the vice-principal accountable. This vignette reflects a broader trend evident in our experiences and data, namely that incumbents in higher level positions of authority generally had less difficulty in identifying the tasks of their subordinates, and were generally more able and willing to specify time spans for both their subordinates and themselves.

INSERT TABLE 4 ABOUT HERE

Table 4 summarizes the estimates of time span obtained for the positions studied in the two systems. We only have one measure of time span for the two Directors (CEOs), that being their self estimates of the longest maximum completion time for tasks for which they were responsible. Both set this at three years, one linking this time span to the three year strategic planning process in his system, the other to several development projects recently completed. For each of the remaining 36 positions studied we obtained three time span estimates: self estimates given by position incumbents (TS Self); the estimates given by incumbents of positions which had *official* supervisory responsibility for the position in question (TS Supervisor); and the same supervisor's estimate of the length of time which would have to elapse before he could conclude, on the evidence, that a new appointee was exercising

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[2] The male pronoun is used throughout our discussion of the data so as to avoid inadvertently identifying systems or participants.

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marginally sub-standard discretion (MSD Span). Table 4 shows means and standard deviations on these measures for each position across both study systems, time spans being shown in months. The fourth data column in Table 4 shows the mean of the three time span estimates. The final column offers our tentative best estimate of the time span which appears most appropriate for each position on the basis of our interpretation of the data available.

The time span estimates for the SO (superintendent) role obtained from incumbents and their Directors are quite consistent, although as the high standard deviations for self and supervisor's estimates suggest, there was a wide range between the minimum and maximum estimates given. As implied by the relatively small standard deviation for marginally sub-standard discretion span, however, the two Directors were in substantial agreement that it would take a little under two years for them to confidently conclude that a new SO was not fully up to the demands of the job.

The data for principals appear far more volatile. The mean self estimate of 40 months was the highest obtained for all positions and is markedly higher than the 30 month mean estimate given by the official supervisors (SOs). An even sharper contrast is evident between the self estimates and mean MSD span of 4.7 months given by the SOs. Moreover, the standard deviations for both self and supervisor's estimates show there was a wide variation in the specific time spans identified. Indeed, the range of both self and supervisor's estimates of time span for the principalship extended from a minimum of 12 months to the maximum of 60, with a tendency for the higher self estimates to be associated with principals of larger schools (r = .488 [n.s.]), regardless of whether they were elementary or secondary schools.

On the basis of our discussions around the interviews and our interpretations of the transcripts, we are inclined to treat the short marginally substandard discretion spans obtained for the principalship with scepticism. While they were formally responsible for supervising the principals interviewed, the SOs who provided these estimates often appeared less than fully informed about or aware of the actual work being done by the principals in question. This was particularly evident when the SOs were asked to describe the responsibilities of their principals and identify the tasks for which they held them accountable. Often the answers given seemed to treat the principals as extensions of central office interests or as trip-wires for the SO's political concerns, rather than as supervisors or leaders of their

schools. One SO, for example, remarked that he expected principals to "head up" system committees: "They research and develop and go out and develop the message. ... I use committees a lot. I provide the leadership. The principals deliver." Another SO, when specifically asked about the evidence he would use to determine if a principal was using marginally substandard discretion, pointed meaningfully to the telephone, and said, "it all depends on that"—meaning the number of calls he would get about a principal and her or his school. We suspect that such evidence might be more indicative of incompetence rather than the less clear-cut notion of marginally substandard discretion. More to the point, reliance on such remote indicators suggests a longer time span of discretion than implied by the MSD means. It is also worth noting in this connection that the descriptions which the principals gave of their work often had little in common with the SO's accounts of what they expected their principals to do, further implying that at least some of the SOs may not have been sufficiently well informed to assess whether or not their principals were doing their jobs well. On the basis of our interpretation of the available evidence, therefore, we concluded that despite the starkly short marginally substandard discretion estimates the mean of the three time span estimates (26.3 months) obtained for the principals probably represents a fair estimate of the time span for the job. This mean was rounded down to 24 months when forming our final time span estimate for the principalship.

Although there are some marked fluctuations in the various time span estimates for the positions of Vice Principal and Department Head, as well as high standard deviations, the overall mean scores of 12.7 and 11.8 months respectively appear to sensibly represent the level of work associated with these positions. In both cases we rounded these means to a one year time span when forming our final estimates. The three consultants included in the study constitute something of a special case. These were teachers on limited term assignments to central office which involved them in various kinds of development projects. As such they occupied staff rather than line positions and enjoyed reasonable latitude in structuring their work. We have insufficient data to draw any sensible conclusions about the nature of their work, and will make no further comment beyond noting that we included their time span estimates in Table 4 primarily in the interests of completeness.

The remaining position of manager demands more sustained attention. These positions were also located outside of the main lines of formal authority in the two systems, but were line positions

within the internal administrative structures of the respective head offices. Specific position titles included personnel manager, financial manager and facilities manager. Incumbents all reported to either the chief business official (a Supervisory Officer) or another SO who had been assigned specific responsibilities for the relevant area of operation. As shown in Table 4, self and supervisor time span estimates fall within a 20 - 24 month band, both mean estimates having large standard deviations. As in the case of the principals, the marginally substandard discretion spans were sharply smaller (mean = 4.2 months) but more consistent (s.d. = 1.5 months). We concluded that in this case these were more realistic estimates—although perhaps unreasonably harsh—as the managers concerned were in almost daily contact with their supervisors. On the basis of self and supervisor descriptions of the amount of discretion exercised in these jobs, however, we again concluded that the overall mean time span of 16.2 months could be accepted as roughly representative of the level of work done.

We did not interview any teachers or students during the pilot study, but the structure of the interview questions ensured that we obtained estimates of time spans for the work of teachers from principals, vice-principals and department heads. Only one of these estimates exceeded 12 months and none were less than 3 weeks. The mean time span estimated by these various supervisors was 6.6 months, and the mean marginally substandard discretion span was 5.5 months. On this basis we concluded that it would be reasonable to tentatively assign a six month time span to the work characteristically undertaken by teachers.

INSERT FIGURE 1 ABOUT HERE

Figure 1 is an error bar plot of the mean time span estimates (data column 4 in Table 4) for all positions studied in the two pilot systems. The numbered circles in this plot represent the mean time spans with the 'T' bars extending from the circles mapping a range of one standard error above and below the mean. In general conformity with Jaques' theory the time span gradient declines from a high of 36 months for the Directors to a low of 12 months for vice-principals and department heads. The most notable feature of Figure 1, however, is the relative parity of the time spans for superintendents and principals, both being plotted slightly above the 24 month level. This implies that while the specific tasks

and responsibilities in the two roles are different, the level of work—the qualitative demands of the two jobs—are similar.

The error bar plot in Figure 2 breaks out the mean time span estimates for the same positions in each of the two school systems studied. This plot shows marked differences for the time spans of SOs and principals in the two systems, the mean estimates for System B being notably higher than for System A with no overlap of the error bars, which are tightly clustered around their respective means. A portion of this difference could be attributed to the unreliability of our pilot data, but even so the magnitude of the difference implies that there is some other factor at work. The most plausible cause is a difference in administrative cultures. As noted in passing earlier, the administrative culture in System B prized ideals of collegiality and team work to a markedly higher degree than was evident in System A. The most interesting aspect of Figure 2, however, is that the time spans for the principals and SOs in each system remain remarkably similar: in System A the mean time span for both roles is around 20 months, and in System B is closer to 36 months.

While the apparent differences between the mean time spans for SOs and principals in the two systems appear marked, the apparent significance decreases when placed within the theoretical framework of Jaques' time span strata as summarized in Table 1. Horizontal lines appear in both Figures to mark Jaques' key time horizons of 12 and 24 months, and the maximum value for each plot was set at the next highest stratum level of 60 months. Viewed in the context of Jaques' strata horizons, the time spans for the Directors, SOs and principals in both systems all fall within or close to the Stratum IV level, implying that each of these positions could or should be viewed as falling with the 24-60 month time span strata. Still, Figure 2 offers what may be strong testimony to the power of organizational culture—shared values and assumptions—in organizations, with the collegial culture of System B perhaps "inflating" perceived time spans for SOs and principals to a similar level of that of the Director. A similar but opposite effect might have depressed SO and principal time spans in System A, although we have no evidence to support such a supposition.

INSERT FIGURE 2 ABOUT HERE

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Figure 3 plots mean time span estimates for principals and vice principals against type and size of school. The cleanest break between time spans in these roles occurs in the case of principals and vice principals in the two larger secondary schools included in the study (one from each system). In each case these principals (mean time span = 29 months, s.d. 10.8) were quite clear about the responsibilities assigned to their vice principals (mean time span = 7.8 months; s.d. 6.8). It is perhaps worth noting here that one of these principals had turned virtually all operational responsibilities over to his vice principals so that he could concentrate on working with his department heads on curriculum and other developmental projects for the school. Another notable finding illustrated in Figure 3 is the relative parity between the mean time spans for principals of large elementary and large secondary schools, implying that the qualitative demands of the principalship may vary more with school size than type. From our reviews of the interview transcripts, the overlapping error bars and the closer mean time spans for the vice principals and principals in the large elementary schools appear to reflect a higher degree of task sharing between role incumbents. With the limited data available this could be a consequence of personality rather than organizational variables, or just an artefact of the small number of observations. Even so, the principals and vice principals in the two large elementary schools had to deal with relatively large amounts of administrative work with very little assistance. As shown in Table 3, whereas the principals and vice principals in the large secondary schools were assisted in their work by a complement of 5 or 5.5 clerical staff and 15 department heads, their peers in the large elementary schools were assisted by but a single secretary.

The contrast between the greater munificence of administrative support in the secondary and elementary schools studied is heightened when the situation in the large elementary schools is compared to that in the small secondary schools. In System A, for example, the principal and vice principal of the small secondary school worked with 9 department heads and 3.5 secretaries as opposed to the single secretary in the large elementary school. The relative abundance of assistance in the small secondary schools could account for the lower mean time spans obtained for the principals in those schools, although again personality factors may have been involved.

INSERT TABLE 5 ABOUT HERE

Table 5 reports responses to the interview question asking "Who do you regard as your boss—the person to whom you are accountable for your work." There are few surprises in this Table. Both Directors said they were accountable to their Boards of Trustees, and all Supervisory Officers said they were accountable to their Director. The single manager who did not identify the chief business official as his superordinate was a personnel manager who assisted the superintendent of personnel in the academic line of authority. Interestingly, one of the eight principals interviewed identified his Director as the person to whom he was responsible and another identified the Board of Trustees. Consonant with the managerial cultures commented on in connection with Figure 2, both of these principals worked in the more collegially oriented System B. With the exception of the single vice principal who declared that he was accountable to an academic SO—more accurately to the management team, this being the vice principal in System B mentioned previously–all of the school based personnel—vice principals *and* department heads—identified their principal as the person to whom they were accountable. The most noteworthy message in Table 5, however, is that all of positions which interviewees identified as supervisory roles had mean time span estimates above or very close to the two year level.

INSERT FIGURE 4 AND FIGURE 5 ABOUT HERE

Figures 4 and 5 summarize relationships between salary, mean estimated time span and expressed satisfaction or dissatisfaction with payment received. While a positive relationship ($r = .44$) is evident between mean time span and salary received, the slope of the regression line shown in the plots is not as steep as called for by Jaques' theory. This is readily explainable on the basis that salaries for most of the interviewees were either directly set through collective agreements negotiated with the powerful teacher unions which are a prominent feature of the Ontario educational landscape, or were determined in the shadows cast by these negotiations. While the Directors and SOs in both boards were employed under individual contracts, their salaries were determined by formulae designed to reflect salaries for similar positions in neighbouring systems, a practice which in effect based salaries on the maintenance of a differential above the salaries of the highest paid principals, a "base" figure which, in turn, is determined through teacher bargaining. This is explicitly dysfunctional—anti-requisite—in

Jaques' scheme, which anticipates that managerial remuneration will be under more direct control of boards and superordinate managers.

The main exception to the situation sketched above concerns the central office managers, who do not benefit from the power of the teacher unions. Thus, while the mean time span estimate for managers (16.2 months) suggests their work is potentially more demanding than that done by vice principals (12.7 months) and department heads (11.8 months), their salaries were on average 29% lower. As shown in Figure 4, this places the managers, coded with the numeral 4 in the plot, at the bottom of the pay distribution for the positions studied. In accord with Jaques' theory, 5 of the 6 (83%) managers expressed dissatisfaction with this state of affairs, stating that their pay did not represent fair compensation for work done. While consonant with the theory, this dissatisfaction does not necessarily mean that the managers are underpaid when compared to pay scales for similar levels of work in other organizations. An alternative and theoretically sound explanation would be that the vice principals and department heads are over compensated for the work they do.

Three principals, two vice principals and one SO also declared their salary represented less than fair compensation for the work they did. Both the principal and the vice principal of one of the large elementary schools were included in the dissatisfied group, but there were no evident empirical reasons for the expressed dissatisfaction of the other principals and vice principals.

Finally, we investigated the possibility that subjects who declared their pay did not represent adequate compensation for work done may have given significantly higher self estimates for the time span of their work, but this was not the case (t = .931, p = .358). Indeed, given the nature of the comments expressed by some interviewees, at least a portion of the expressed dissatisfaction with salary could be attributed to an unrealistic appreciation of payment levels in the larger economy coupled with simple old fashioned greed.

Discussion

We are acutely aware of the limitations of the data currently available to us. Our samples of administrative work are limited to two school systems, both of which turned out to have quite different managerial cultures despite marked structural similarities. We did not obtain direct time span estimates

from clerical or maintenance staff or, more importantly, teachers and students. Nor did we fully implement Jaques' recommended method, as time span estimates from MoRs were not consistently obtained. Moreover, our interview schedule went through six modifications as the pilot study progressed. All of these factors most likely contributed to the high standard deviations associated with many of the time span measures reported, which in turn suggest these data are not overly reliable. There are, nonetheless, at least two other potential sources for the variability in time span estimates that need to be entertained. The first concerns structural variations within officially designated positions and the second the potential effect of individual differences in time span capacity.

The analysis presented in the previous pages assumed that officially designated positions of responsibility in school systems correspond to different levels of work in the Jaqusian sense, and that there would be at least a rough homogeneity of work across similarly designated positions. In other words we assumed that while some specific tasks and responsibilities will vary from case to case, one principal's work will be much the same as another's, and this will hold true for the other positions studied. As far as principals are concerned this did appear to be the case from the self descriptions we obtained of their work and from the time span estimates we collected. Indeed, our tentative finding that school size (enrolment) appears to be a more influential variable than school type (elementary or secondary) in determining the level of work faced by principals is directly in line with Jaques' theory. For Supervisory Officers and managers, however, the situation was more complex, with incumbents of specific roles—such as Superintendent of Business or Program, or financial or personnel managers—having quite different responsibilities. We were unable to sensibly explore actual differences and potential effects within current data limitations, but plan to employ more precise role definitions in future work in an attempt to better account for differences in work at these levels, and to more accurately map time span differences. The main implication of this for the present analysis is that by classifying all SOs and managers into homogeneous categories we may have over-estimated the time spans associated with some specific job descriptions at these levels.

A further source of variation in our time span estimates could be rooted in personal differences between role incumbents. Jaques' broad theory carries with it the claim that not everyone is able to function at his higher levels of abstraction, and thus within his higher time span levels (Jaques, 1978,

1986; Stamp, 1981). To the contrary, he argues that individuals with the cognitive power to operate at his highest levels of abstraction are likely comparatively rare. Despite folk myths to the contrary, it is simply not true, he contends, that *everyone*—or more realistically most people—is *able* to be the President of the United States, a Field Marshall, or the CEO of a large organization: many (most?) people would simply be unable to handle the conceptual demands of the work involved. The basal notion of variation in cognitive capacity thus carries with it the implication that some positions of responsibility in school systems—and other organizations—may be occupied by individuals who are unable to cognitively manage or exploit the full demands of the work to be done. Similarly, it is reasonable to expect that some people are capable of functioning at a higher level of abstraction than is required by the work encountered in their formal role. The immediate implication for the data discussed in this paper is that the estimates of time span given by our interviewees may have been influenced by individual variations in their cognitive capacity, and thus their ability to comprehend opportunities for higher levels of work in the roles studied. The problems posed by this source of potential variation in time span estimates are not limited to our pilot study but will be general to all attempts at applying Jaques' theories. Given that the teacher pool from which administrators are drawn may contain a higher proportion of conceptually able individuals, this problem may be particularly acute in school systems.

Depth structure

One of the attractive properties of Jaques' theory is the claim that a more or less invariant depth structure underlies the manifest structure of bureaucratic organizations. Not only does this notion offer potentially sound theoretical grounds for appraising and adjusting organizational structures, it offers a potential means of reliably comparing the administrative structures of publicly funded school systems to other organizations, especially the oft praised, assumedly more efficient, structures supposedly found in the private sector. Our pilot study data are obviously not adequate to sensibly address these issues, but they do suggest several intriguing possibilities that could warrant further thought and study.

First there is the question of how the systems studied might map onto Jaques' general theory of organizational depth structure. As discussed earlier, both systems would be recognized as Stratum V organizations with 5–10 year time spans for their CEOs if either total enrolment or total organizational membership (employees plus students) were taken as the appropriate measure of organizational size. If,

however, total number of employees is used as the measure of organizational size, then both systems would qualify as Stratum IV organizations with a 2--5 year time span for their Directors. From the data summarized in Table 4 and Figures 1 and 2, neither of the Directors (CEOs) reported that their work engaged them in tasks and problems within the 5--10 time span range. To the contrary, they both independently agreed that their work was at a 3 year time span level, comfortably within Jaques' 2--5 year Conceptual Modelling level of abstraction. On this basis, then, we have grounds for classifying both systems as Stratum IV organizations. It well could be the case, of course, that neither Director was capable of operating at the Intuitive Theory level of abstraction that Jaques deems necessary for leadership of a Stratum V organization, and thus both systems could be sensibly viewed as potential Stratum V organizations awaiting appropriate leadership. The implication here is that if similar sized school systems can be found with CEOs that do think of their work with a 5--10 year time frame—and can demonstrate this with verifiable instances of work completed or underway—then parallel differences in internal operation and overall effectiveness should also be evident.

The most intriguing feature of our data, however, is the comparable time spans associated with the work done by all of the more senior administrators—Directors, SOs and Principals. As summarized in Table 4, we concluded the work encountered in each of these positions had time spans within the 24 - 36 month range, which places each position at the Stratum IV managerial level and the associated Conceptual Modelling level of abstraction. Taken at face value this appears unreasonable, as it implies each school system was cursed with the conceptual equivalent of 34 Chiefs and no administrative subordinates, except as a result of purely functional divisions of responsibility. Yet just such a situation is supported not only by our time span data but by related indicators. There was only a 10% differential between average salaries for principals and SOs, for example, and only a 13% difference between average salaries for Directors and SOs. Moreover, the collegial managerial culture found in System B and reflected in the virtually identical time span levels for the Director, SOs and Principals in that system, also conforms to the idea of equivalency being advanced. The greater distance between time spans for the Director and his SOs and Principals in System A as mapped in Figure 2 could also be interpreted as an alternate form of cultural adaptation to essential equivalency in the level of work for these positions. As shown graphically in the Figure, SOs and Principals in System A were placed at almost identical time

span levels which, while just below the key two year time horizon, could be interpreted as a consequence of the Director (and perhaps his formal subordinates) attempting to maintain what was accepted in the system culture as an appropriate authoritative distance between the CEO and other senior administrators. In Jaques' theory, of course, such distance would have been assured if the Director had been operating above the next highest 5 year time span threshold. As this was not the case, then the presence or development of a more hierarchical culture may have depressed perceptions of work level for SOs and principals below their appropriate level.

These speculations are, of course, just that, for without additional data we are powerless to resolve the issues raised. Still, if the relative similarities between the time spans for administrative work done by Directors, SOs and Principals is tentatively accepted, this suggests that Jaques' theory may not apply to school systems because they do not readily conform to his underlying model of AcHs. There is, however, a least one alternative explanation that fits our data and conforms to other findings in the broader literature.

The theory we would like to tentatively advance builds on Meyer and Rowan's (1977) observations regarding the lack of tight coupling between school system central offices and schools. Our theory is that school system central offices and their nominally subordinate schools can be sensibly viewed as two parallel, interdependent, but essentially semi-separate or autonomous organizations. Central offices have the main tasks of attending to personnel, co-ordinative and political tasks for a geographically based collection of schools, while the schools attend to their educative and socialization functions for defined populations of pupils. Under such a model, school principals can be seen as the chief administrators of Stratum III or IV organizations (depending on size), the core technology of which involves students and teachers in learning activities. This conforms to our time span estimate of 24 months for the principalship, and fits with variations around that level discussed in relation to larger and smaller secondary and elementary schools. Consequently, the appropriate measure of organizational size for schools can be taken as being *enrolment*, which in turn justifies the status of the schools we studied as Stratum III and IV organizations. Central offices, on the other hand, are primarily concerned with administering personnel functions for employees of the board—payroll, benefits, collective negotiations, staffing and so forth—attending to maintenance, construction, transportation and supply

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functions, co-ordinating broader curriculum policy, and managing political and fiscal environments. As such the organizational technology at the core of central office functioning is primarily focused on personnel concerns and management of the ritual of confidence mechanisms discussed by Meyer and Rowan. Viewed in this light it makes sense to take the total number of system *employees* as the appropriate measure of organizational size for school systems. Under such an assumption, the two systems studied would therefore also both qualify as Stratum IV organizations (340–2,500 employees) in Jaques' scheme, which conforms with the time spans observed for SOs and Directors.

One of the more immediate implications of this theory of quasi-independent schools and central offices suggests that system CEOs (Directors in this study), would qualify as the appropriate managers for principals in Stratum IV school systems, rather than the intermediate superintendents who typically occupy that role. Having SOs (assistant superintendents in other North American jurisdictions) report to CEOs in discharging their system level responsibilities, with principals reporting separately to the CEOs for their school specific responsibilities would, within the limits of the data currently available to us and the theory advanced here, be a requisite ordering of responsibilities in school systems at and below the Stratum IV size level. To be fully functional in a Jaqusian sense, however, such an arangement would require the CEO to be be capable of operating at the 5 year, Intuitive Theory, level of conceptual abstraction.

Conclusion

Inquiry into the organizational nature of schools and school systems has long been handicapped by the lack of useful theory to guide and stimulate study. From our experiences in the pilot work reported here we are inclined to think that Jaques' theories may help to fill this void. Over the next several years we plan to undertake a more complete and representative study of the applicability and implications of his theories for school system organization and administration. Our current plans call for studies of larger school systems and particularly their central offices, in an attempt to identify chief (and other?) administrators operating at higher time span levels, as well as the collection of larger "samples" of the work and associated time spans undertaken by principals, superintendents and managerial staff, as well as teachers and students. Given our initial findings as reviewed here, we also want to probe the

tenability of our theory of parallel but quasi-independent school and central offices as sketched above, as well as the effect which different managerial cultures can have on the way administrative work and responsibilities are understood in school systems.

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Table 1

Key Conceptual and Empirical Horizons in Jaques' Theory

Stratum	Time Span [months]	Level of Conceptual Abstraction	Size (Max Employees)	Domain	Equitable Payment
VII	20 yrs [240]	?	> 150,000	Strategic Corporate	Base x 8
VI	10 yrs [120]	Institution Creating	150,000		Base x 4
V	5 yrs [60]	Intuitive Theory	20,000	Integrative General	Base x 2
IV	2 yrs [24]	Conceptual Modelling	2,500		Base
III	1 yr [12]	Imaginal Scanning	340	Operational	55% Base
II	3m. [3]	Imaginal Concrete	50		31% Base
I	< 3 months	Perceptual Motor Concrete	1	Shop/Office Floor	17% Base

Table 2

Descriptive Data for Sample Systems

	System A	System B
Trustees	15	14
Directors (CEOs)	1	1
Supervisory Officers (S.Os.)	4	4
Schools & Principals	29	29
Teachers	712	613
Students	13,000	11,000
Total Employees	1,534	916
Total Membership	14,536	11,916

Table 5

Distribution of positions identified as having

supervisory responsibility

		Position held by person identified as the individual to whom respondent is accountable for his or her work.				
Positions Studied	N	Board	Director	Academic SO	Business SO	Principal
Director	2	100%				
SOs	8		100%			
Principals	8	12.5%	12.5%	75%		
Managers	6			16.7%	83.3%	
V.Ps.	6			16.7%		83.3
D.Hs.	5					100%
Consultants	3			100%		
Total	38	3	9	11	5	10
Total %	100%	7.9%	23.7%	28.9%	13.2%	26.3%

Table 3

Descriptive Data for School Sites

	System A				System B			
Positions	Elementary		Secondary		Elementary		Secondary	
Size	Small	Large	Small	Large	Small	Large	Small	Large
Principal	1	1	1	1	1	1	1	1
Vice-Principals	0	1	1	2	0	1	1	1
Dept. Heads	0	0	9	15	0	0	10	15
Clerical Staff	1	1	3.5	5.5	0.8	1	2	5
Teachers	12	38	43	92	14	25	26	62
Students	235	700	542	1,315	227	463	381	939

Table 4

Time Span Estimates for Positions Studied

Position		T.S. Self		T.S. Supervisor		MSD T.S.		Mean Time Span		Time Span Estimate
	N	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	
Directors	2	36.0	0	-	-	-	-	36.0	0	36
S.Os.	8	27.8	13.6	31.5	17.6	22.9	3.2	27.4	9.0	28
Principals	8	40.5	15.6	29.2	21.8	4.7	3.5	25.6	8.2	24
V.Ps.	6	12.3	8.6	19.2	18.4	7.4	9.5	13.4	6.7	12
D.Hs.	5	9.2	8.6	21.0	18.0	5.8	4.7	11.8	8.0	12
Managers	6	21.0	10.6	23.3	10.9	4.2	1.5	16.2	5.4	18
Consultants	3	26.0	17.3	20.0	13.9	10.6	11.5	18.9	12.4	?

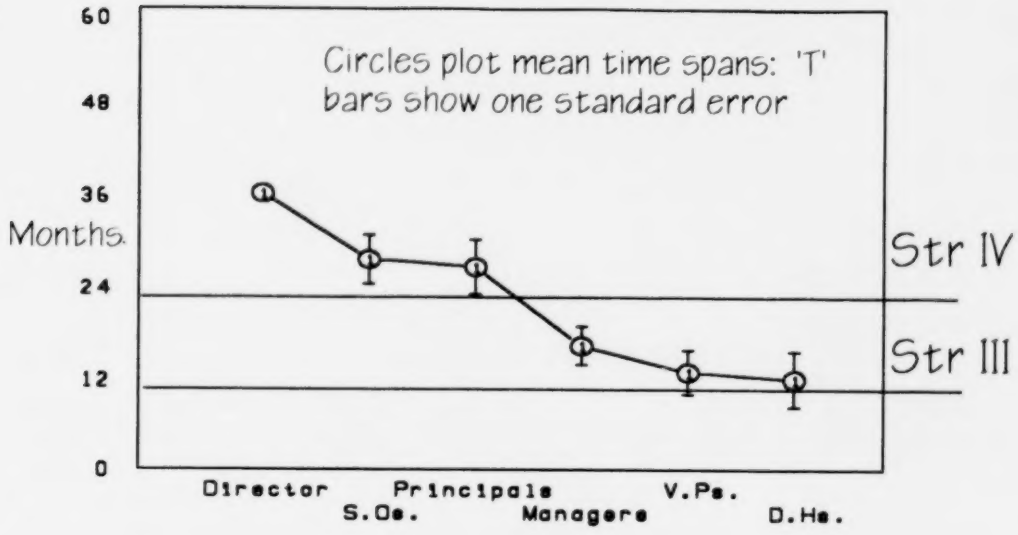

Figure 1 Error Bar Plot of Mean Time Span Estimates for Positions Studied.

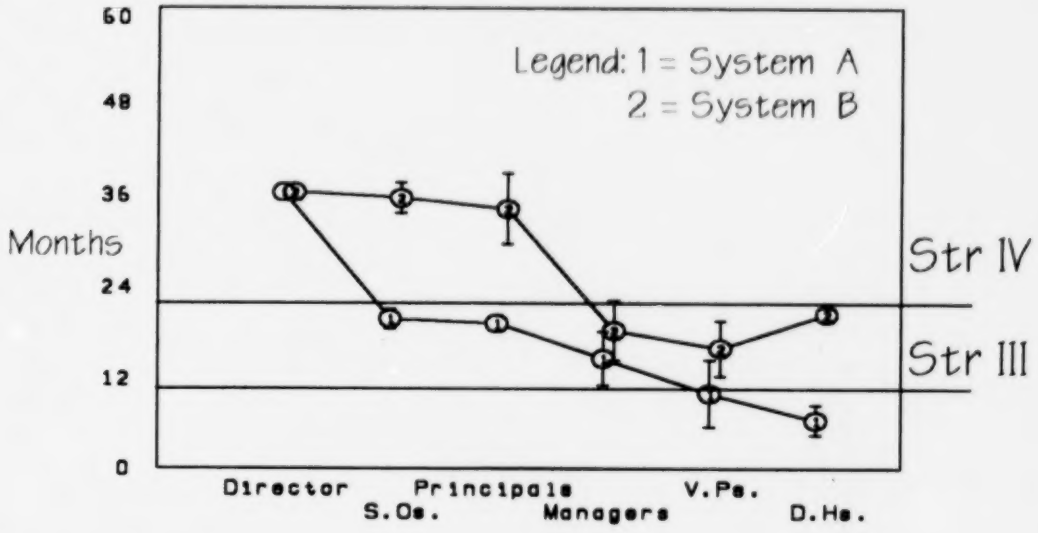

Figure 2. Error Bar Plot of Mean Time Span Estimates for Positions in Both Systems.

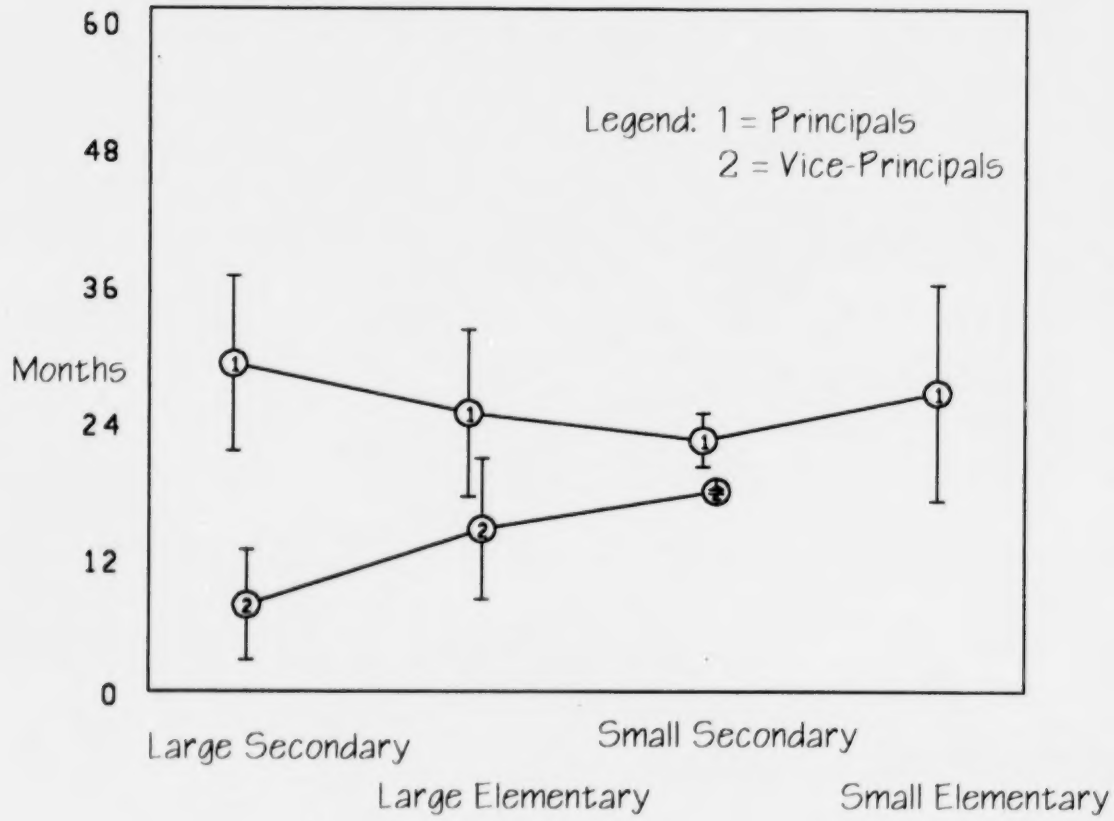

Figure 3. Mean Time Span for Principals and Vice-Principals by School Size.

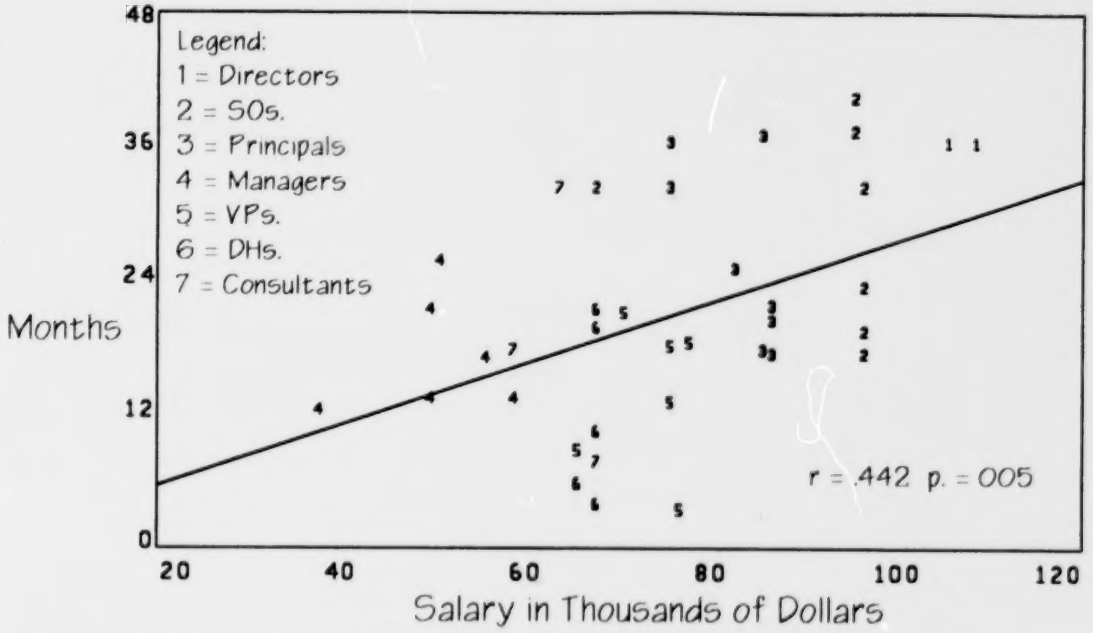

Figure 4. Mean Time Span by Salary Showing Position

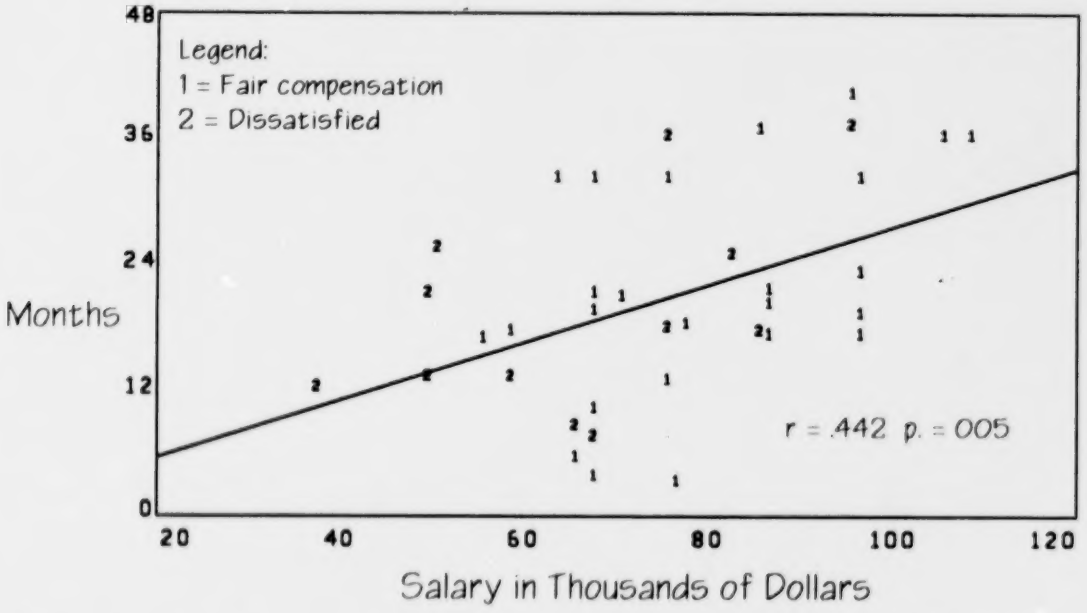

Figure 5. Stated Fairness of Pay for Work Done

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